

# Gigawatt-Scale Energy Storage (Services)

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# Stem Overview



Stem operates the world's smartest and largest digital energy storage network

Founded:	2009
Headquarters:	Millbrae, CA
Employees:	150+
Operations In:	CA, HI, NY, TX, MA, Japan, ONT
Pipeline & Installed:	900+ sites, 250+ MWh
8 utility contracts:	350 MWh
Project Finance:	\$650 MM

## High Caliber Global Investors



ANGELENO GROUP

RWE

MITHRIL



MITSUI & CO., LTD.



## Distinguished Honors & Awards



# Storage is Software

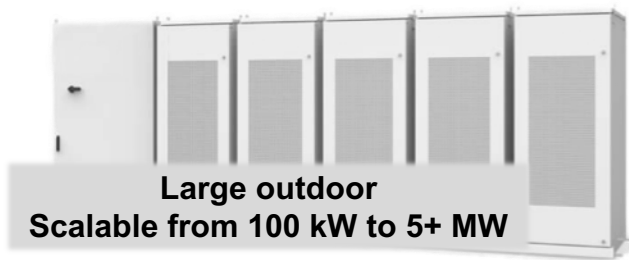


## Athena™ Artificial Intelligence

Automatically controls when energy storage charges and discharges to optimize timing, maximize savings, and create virtual power plants.



**Small indoor  
18 kW modules**



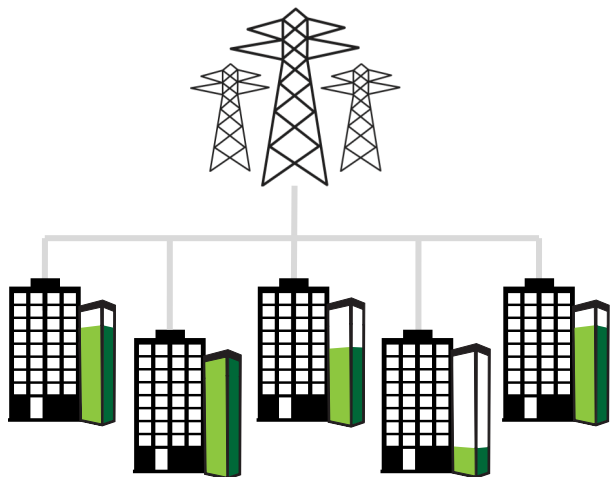
**Large outdoor  
Scalable from 100 kW to 5+ MW**



**Medium indoor  
132 kW modules**

Hardware  
Vendor X

# Storage is Services



## Virtual Power Plant (VPP)

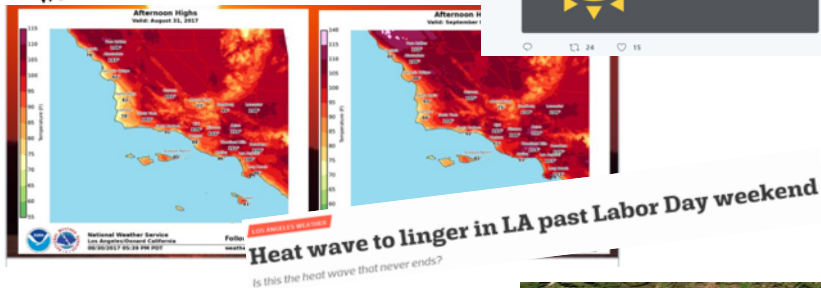
- Cloud-based AI software automatically optimizes each system to preserve customer benefits while providing support to the grid
- VPP receives automated signals from grid operators to dispatch the resource for local or system needs

*For grid operators and wholesale markets, VPPs use storage to turn distributed energy resources (DERs) from uncertain load modifiers to dispatchable, reliable, continuously scalable grid resources*



# VPPs for extreme grid conditions

Southern California broils amid 'dangerous' heat wave that will last all week



Current Active Notice

Southern CA Region TR

The California ISO hereby issues this notice effective 12/08/2017 00:00 through 12/08/2017 23:59 based on conditions as of 12/08/2017 12:00.

On August 28, 2017 Stem simultaneously dispatched 14 VPPs (over 100 systems)



Calif. (University)

## Reliability and Resilience Needs

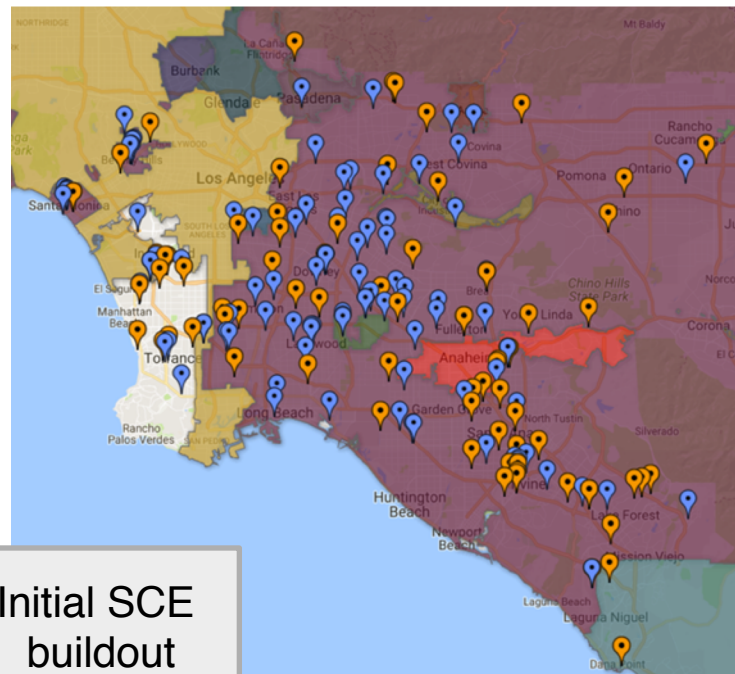
- > Unprecedented heat waves
- > Ongoing wildfires disrupting transmission
- > Southern CA gas supplies

## Stem's VPPs are working

- > Wholesale market since 2014
- > 700+ dispatches over 3 years
- > Hundreds of real-time market calls – no manual intervention

# Select utility contracts

- SCE LCR: 85 MW, 4 HR peak capacity resource
  - Transmission-constrained area
- Con Ed: 857 KW DR through 2018 for BQDM distribution deferral
- HECO: 1 MW, 3-year pilot to respond to high penetrations of PV
- Austin Energy: SHINES grant to increase grid performance & reliability, enable high PV penetration



Initial SCE  
buildout

# Gigawatts of Storage Services



## **BTM Storage**

Convert all building load  
to grid services



## **Local and System Capacity**

VPPs are competitive  
with traditional generation



## **Renewables Penetration**

Critically useful to  
integrate renewables





# stem

Energy Superintelligence™